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Needs Assessment Survey for Mechanics Training of the Automotive Service Industry, Albuquerque, New Mexico

National Center for Vehicle Emissions Control and Safety, Fort Collins, CO

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This document presents the rationale, design and results of a study to determine the current level of mechanics training in Albuquerque, New Mexico. A survey instrument was developed for this study which may be suitable for use in similar studies. Results characterize the service industry in terms of training needs, willingness to participate in training, and attitude towards emission control training.

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DISCLAIMER

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SECTION I

1.0 INTRODUCTION

The City of Albuquerque and Bernalillo County, New Mexico have been designated as areas not attaining the ambient air quality standards for the pollutant carbon monoxide (CO).

A mobile source air pollution control strategy has been developed for the reduction of pollutant levels within Bernalillo County. The primary element in this strategy is the implementation of a mandatory program of annual motor vehicle inspection and maintenance (I/M) for certain categories of vehicles registered in Albuquerque and Bernalillo County.

Bernalillo County, New Mexico encompasses an area of 1,169 square miles. Within the County are located three municipalities, the largest of which is the City of Albuquerque with an area of 94 square miles.

The population of Bernalillo County is calculated to be 384,200 persons, of which 302,834 reside in the greater Albuquerque area.

The 1978 motor vehicle population of Bernalillo County was 205,484 vehicles.

Technical and financial assistance is being provided to the Department of Environmental Health of the City of Albuquerque by Region VI (Dallas) of the United States Environmental Protection Agency (EPA) for the development of the I/M program. Under this program of federal assistance, the National Center for Vehicle Emissions Control and Safety (NCVECS) at Colorado State University has been contracted to develop and initiate a program of training in the diagnosis and repair of excessive hydrocarbon (HC) and CO emissions for the auto mechanic population of the Albuquerque area. The National Center has the additional responsibility to develop and coordinate a public awareness program in association with the training effort.

As a first step in developing the mechanics' training program, it was decided by the EPA Project Officer, the CSU Project Manager and the Air Pollution Control Officer of Albuquerque, that a needs assessment of the automotive service industry in Bernalillo County would be conducted.

The needs assessment was performed during a four-day period in mid-September, 1979. This report presents the findings and recommendations based upon personal interviews with vehicle service personnel throughout Bernalillo County, New Mexico.

1.1 Background

The implementation of Inspection and Maintenance (I/M) programs in a state or community is invariably accompanied by controversy. The concept of I/M has developed national alliances of organizations which are supportive, and those which have adopted a critical posture. The state and local affiliates of these national groups such as the Lung Association, American Automobile Association, Sierra Club, etc, typically reflect national policy with regards to I/M. Between these polarized points of view lies the larger middle ground of unformed opinion.

A major component of the affected population within an I/M program area is the automotive service industry. The owners, managers and employees of businesses engaged in the repair and maintenance of motor vehicles play a key role in the success of I/M wherever it is implemented. Accurate information concerning I/M must be provided to these individuals in order to assure not only that proper and effective repairs are performed on identified high-emitting vehicles, but also to mitigate adverse public reaction to I/M. Both the quality of the repairs, and the perceived attitude with which they are performed will influence the opinions formed by the general public in the months following the initiation of I/M in a given area.

The strategy that has been developed for the training program in Albuquerque is designed to produce a broadly-based cadre of automotive service industry personnel knowledgeable in the diagnosis and repair of excessive emissions. In order to determine the potential student population for the training sessions and to obtain other data necessary to properly develop course content and schedules, a needs assessment survey was developed and conducted of all known automotive repair facilities in Bernalillo County, New Mexico which are routinely involved with tune-up work and/or engine systems repair.

1.2 Objectives

The objectives of the needs assessment survey were to develop data, based on personal interviews with automotive service industry personnel, indicative of the following:

1. The current number of mechanics employed in the Albuquerque area and their distribution among the various industry segments;

2. The background level of tune-up related training among the mechanic population;

3. The extent of objectively demonstrated expertise in the tune-up area;

4. The distribution of NIASE tune-up certified mechanics within the service industry;

5. The current perceived need for additional low-emissions tune-up training;

6. The preferred schedule of training classes which would elicit the maximum attendance;

7. The current attitudes among service industry personnel regarding participation in a voluntary low-emission tune-up certification program.

8. The willingness of automotive service facility operators to have their equipment and procedures periodically inspected by city personnel;

9. The infrared exhaust gas analyzer equipment capability of the service industry.

Further objectives of the project were:

10. To explain the Albuquerque I/M program to each service facility manager;

11. To attempt to influence the attitude formation of the respondents through dissemination of accurate information concerning the role of the service industry in the I/M program's goal-attainment;

12. To develop the foundation for future relations with the service industry through the provision of an input mechanism to the planning process.

13. To determine if the expressed opinions of service industry spokesmen are reflective of attitudes of rank and file mechanics.

1.3 Methodology

1.3.1 Determination of Needs Assessment Format

The primary purpose for conducting this needs assessment was to obtain useful information concerning the need for mechanic training in the Albuquerque area. Based on this objective, the project principals concluded that a questionnaire would be designed to provide the desired data. (See Appendix A)

In consideration of the overall size of the automotive service industry in Bernalillo County, and the anticipated low return rate for mail-back responses, it was decided

to conduct personal interviews with representatives of the area's service facilities.

The interview format would also optimize the attainment of the less tangible, but important, public relations objectives.

1.3.2 Sample Selection

Preliminary investigations of the automotive service industry in Bernalillo County indicated that there were approximately 350 facilities which could potentially qualify as survey respondents. In order to reduce ambiguity and to avoid the omission of key local persons from the personal contact, it was decided that the sample population for the needs assessment would consist of 100 per cent of the known facilities in Bernalillo County, New Mexico which met the following two (2) criteria:

1) The facility must routinely perform engine tune-up work and/or carburetor maintenance, and

2) Either the owner, manager or a person employed as a mechanic at the facility must consent to participate in the survey.

The yellow pages of the telephone directory for Albuquerque and surrounding areas were utilized to obtain a list of subject facilities.

1.3.3 Categorization of Albuquerque Automotive Service Industry

Four (4) categories of automotive service facilities were identified for the purposes of data reduction and analysis. These stratifications were based upon generic market distinctions among the various industry segments. The 4 categories are listed and defined as follows:

I. New Car Dealerships - Those facilities primarily engaged in the franchised sale of new motor vehicles to the general public. In order to qualify as a respondent in this needs assessment, the facility must operate a service division for the maintenance and repair of engine systems. The presence of internal policies restricting service to those makes sold by the dealership did not disqualify the facility from participation in the survey.

II. Full-service Gasoline Retailers - Those facilities primarily engaged in the driveway sales of gasoline,

other petroleum products and associated goods and services to the general public. In order to qualify as a "full-service" facility, there must be functional service bays on the premises in which engine maintenance is routinely performed.

III. Independent Service Garages - Those facilities engaged in the business of performing tune-ups, carburetor repairs, brake, front end, electrical and other types of work on motor vehicles, but which are not affiliated with a gasoline retailing operation or new car dealership. Exceptions to the prohibition on retail sales of gasoline were made in the case of chain store automotive service departments. For the purposes of this needs assessment, firms such as Sears, Wards, K-Mart, etc., which operate service facilities were classified as Independent Service Garages.

IV. Tune-up Specialists - Those facilities engaged exclusively in performing engine tune-ups and directly related carburetor and/or electrical work. Any other type of vehicle servicing such as brake work or gasoline sales would place a facility in either category II or III above.

1.3.4 Needs Assessment Interview Team

The size of the interview team was subject to consideration of several variables. Among these were:

1. The estimated size of the sample population (350 facilities)

2. The allotted time for the field operations i.e. data collection (4½ days)

3. The human and physical resources available locally in Albuquerque. These include manpower, meeting space, vehicles, copy equipment and coordination of daily communications.

A total of six (6) individuals participated in the needs assessment as interviewers. They were provided from the following sources:

National Center for Vehicle Emissions Control and Safety - two

Albuquerque Department of Environmental Health - two

Albuquerque Technical Vocational Institute - two

The two persons from the National Center included the needs assessment team leader and another experienced employee of the Center. The two persons from the City Department of Environmental Health were experienced employees of the air pollution

control division of that agency. The two persons from Albuquerque Technical Vocational Institute (TVI) were experienced mechanic instructors.

1.3.5 Mitigating Measures to Remove Potential Biases

Because each of the principal parties involved in the implementation of an I/M program in Albuquerque, as well as the members of the interview team itself, has an identifiable vested interest in the outcome of the needs assessment, particular caution had to be exercised to minimize potential areas of bias.

The areas of potential bias and the associated mitigating measures were identified as follows:

1. Questionnaire design - The potential existed for survey questions to be devised in such a manner as to elicit a majority of predetermined responses. This potential was countered by objectifying each survey item and eliminating any descriptive or qualifying language from the text of the questions.

2. Interviewer bias - Because of the diversity of the survey team in terms of backgrounds and interests, a multiplicity of variables presented a potential for obtaining biased interview responses. These variables were reduced, as much as possible, to a set of standard statements and behaviors. Each member of the survey team was briefed on the appropriate manner in which to approach each facility, the method of making initial inquiry to determine the person in charge, the required format for making personal introductions and the way in which to conduct the interview.

   In addition, each interview was preceded by handing the respondent a copy of a letter of introduction request for cooperation, and endorsment of the survey, signed by the Mayor of Albuquerque. (See Appendix C)

3. Analytical Biases - The needs assessment team leader who was responsible for reporting the survey findings to the project principals, was also a member of the interview team. In order to eliminate the possibility of a biased analysis of the field data, a person not involved with any other aspect of the Albuquerque Project was utilized to tabulate the raw data. Because of the objective nature of the survey questions, and the measures taken to mitigate bias during the personal interviews, the reporting of the tabulated data was a straight forward task.

   There remains the potential for the introduction of bias into the conclusions and recommended actions. The National

Center has an implicit interest in the dissemination of vehicle maintenance information through the mechanism of formal training courses. It must be noted, however, that inasmuch as the National Center was already under a contractural obligation to Region VI of the EPA to devise and conduct a certain number of mechanic training sessions in the Albuquerque area, a purpose of the needs assessment outcome was not to "sell" the services of CSU, but simply to obtain input relative to the objectives specified in Section 1.2 of this report.

SECTION 2

SUMMARY OF FINDINGS

2.1 ACTUAL SAMPLE POPULATION

Prior to the commencement of the field operations portion of the needs assessment, an estimate was made that the potential sample population was approximately 350 discrete facilities. The interview team, in a comprehensive search of all commercial streets, guided by previously-located service facilities, was able to find only 206 facilities engaged in the requisite repair work at the time the survey was conducted. The second qualifying criteria was met by 201 of 206 facilities located. Five (5) facilities refused to participate in the needs assessment and, therefore, did not contribute any further data to the study.

A breakdown, by type of facility, of the survey respondents is contained in Table 2-1.

TABLE 2-1 BREAKDOWN OF SURVEY RESPONDENTS BY FACILITY TYPE

Type of Facility	Number of Respondents	% of Total
I New Car Dealerships	21	10.5
II Full Service Gasoline Retailers	113	56.2
III Independent Service Garages	58	28.8
IV Tune-Up Specialists	9	4.5
TOTALS	201	100.0

The 201 facilities participating in this needs assessment represent 97.7% of the known automotive service facilities performing tune-up related work in Bernalillo County.

2.2 CHARACTERIZATION OF ALBUQUERQUE AREA MECHANICS

Several objectives of this needs assessment concern the mechanic population of the Albuquerque area. It is important to characterize practicing mechanics in order to determine (1) the distribution of employed mechanics within the industry, (2) the number of mechanics presently possessing higher than average skills, knowledge and/or motivation, and, (3) the distribution of these latter individuals within the service industry.

The distribution of mechanics among the facilities surveyed is given in Table 2-2.

TABLE 2-2 ALBUQUERQUE AREA MECHANICS CHARACTERIZED BY PLACE OF EMPLOYMENT

	Type of Facility	Number of Mechanics Employed	% of Total
I	New Car Dealerships	363	43.0
II	Full Service Gasoline Retailers	258	30.5
III	Independent Service Garages	201	23.8
IV	Tune-Up Specialists	23	2.7
	TOTALS	845	100.0

It should be mentioned that the definition of the word "mechanic" was discovered to be a very loose one. A limited number of respondents indicated that some distinction exists between a skilled professional automotive service technician (i.e. the ideal mechanic) and the run-of-the-mill shop employee (i.e. the self-styled mechanic). For most of the service personnel contacted, however, a "mechanic"was apparently perceived to be anyone who, in the course of a normal day's job activity, had occasion to perform underhood service work.

This variation in the usage of the term "mechanic" may explain, in part, the finding that only 18.7% of the mechanics employed at facilities surveyed possessed current certification in tune-up procedures by the National Institute of Automotive Service Excellence (NIASE). This certification is the hallmark of technical proficiency in the automotive service industry. Attainment of NIASE certification in a given area of vehicle servicing or repair work presumes extensive training and/or experience in that area.

The distribution of NIASE tune-up certified mechanics is shown in Table 2-3.

TABLE 2-3 DISTRIBUTION OF NIASE TUNE-UP CERTIFIED MECHANICS AMONG THE VARIOUS AUTOMOTIVE SERVICE INDUSTRY SEGMENTS

Type of Facility	NIASE - Certified vs. Total Mechanics	% of category
I New Car Dealerships	94/363	26.0
II Full Service Gasoline Retailers	30/258	11.6
III Independent Service Garages	29/201	14.4
IV Tune-Up Specialists	5/23	21.7
TOTALS	158 of 845	18.7

Of the survey respondents, representing 201 service facilities, 61, or 30.4%, indicated that at least one NIASE tune-up certified mechanic was employed at their facility.

These 61 facilities are listed by category in Table 2-4.

TABLE 2-4 BREAKDOWN OF FACILITIES EMPLOYING AT LEAST ONE NIASE TUNE-UP CERTIFIED MECHANIC

Type of Facility	Number of Facilities with Certified Mechanics	% of category
I New Car Dealerships	19 of 21	90.5
II Full Service Gasoline Retailers	21 of 113	18.6
III Independent Service Garages	18 of 58	31.0
IV Tune-Up Specialists	3 of 9	33.3
TOTALS	61 of 201	30.4

The perceived conclusions concerning the findings discussed above are that:

1) Many automotive service industry personnel consider themselves and co-workers to be "mechanics", when there are no objective criteria upon which to base this title.
2) The only service facility category in which a majority of the members employ NIASE tune-up certified mechanics are New Car Dealerships (90.5%).
3) Despite the relatively small proportion of new car dealerships compared to the rest of the automotive service facilities (10.5% of total), these dealerships employe 43.0% of the area's mechanics.
4) The term "mechanic" appears to be most loosely applied to employees of full-service gasoline retailers. These facilities employ the smallest percentage of certified mechanics (11.6%). In addition,

fewer of these facilities have certified mechanics among their employees (18.6%) compared to the other three categories.

Figure 2-1 illustrates the overall distribution of mechanics in the Albuquerque area automotive service industry, and compares this to the distribution of NIASE tune-up certified mechanics.

2.3 BACKGROUND LEVEL OF TUNE UP-RELATED TRAINING

In the needs assessment questionnaire, several items concerned previous formal training experience in the area of tune-up procedures. Because only one person was interviewed at each facility surveyed, the data were developed in terms of facilities and not actual numbers of mechanics. Table 2-5 shows the breakdown of facilities having at least one employee with formal training in tune-up procedures.

TABLE 2-5 . FACILITIES WITH AT LEAST ONE MECHANIC FORMALLY TRAINED IN TUNE-UP PROCEDURES

Type of Facility	Number of Facilities with Tune-Up Trained Mechanics	% of category
I New Car Dealerships	21 of 21	100.0
II Full Service Gasoline Retailers	98 of 113	86.7
III Independent Service Garages	54 of 58	93.0
IV Tune-Up Specialists	7 of 9	77.8
TOTALS	180 of 201	89.5

As can be seen from Table 2-5, a high percentage (89.5%) of all service facilities reported have trained employees. There is some cause to question the efficacy of mechanic training as it relates to the quality of work performed.

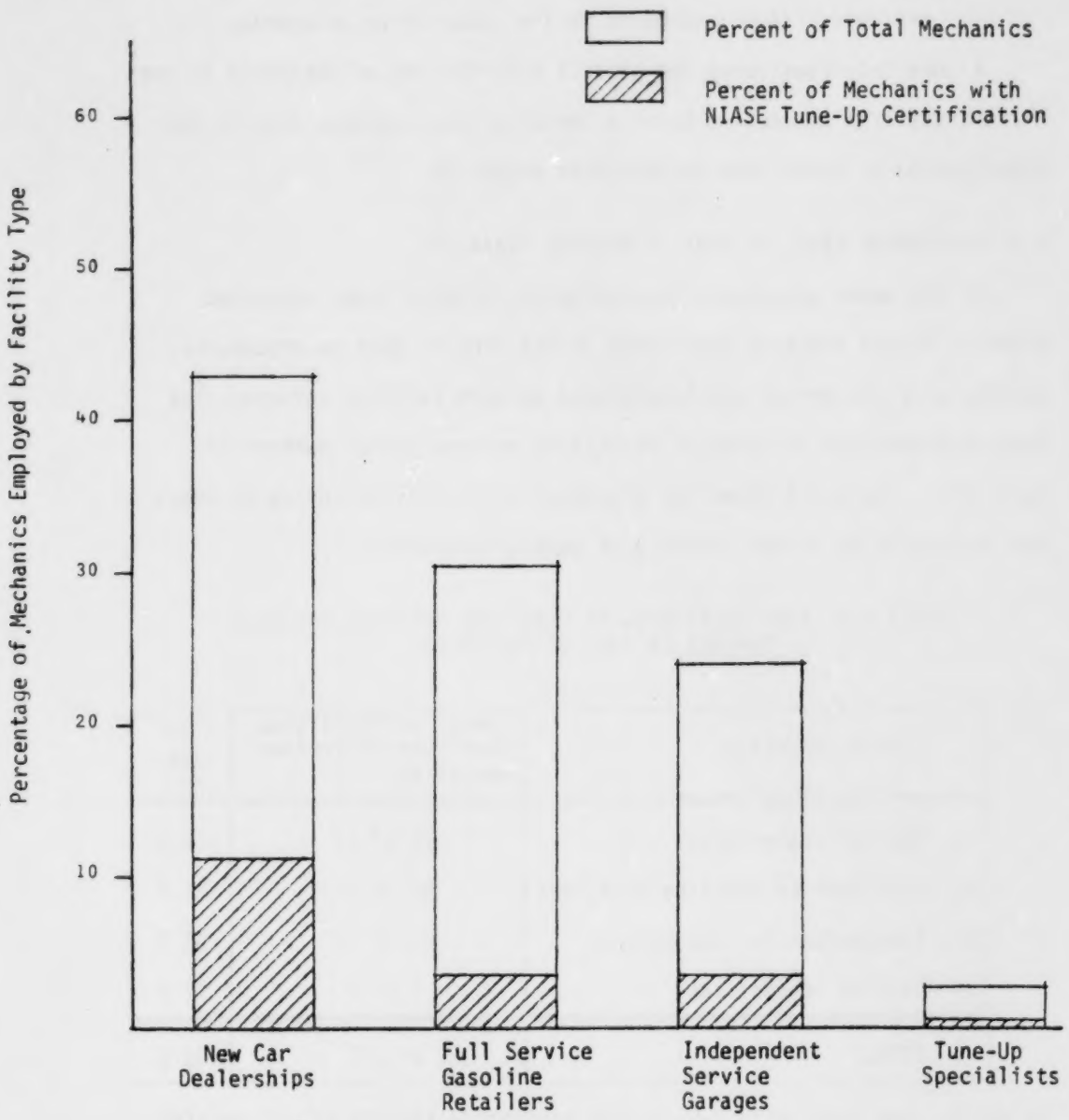

FIGURE 2-1

Percentile distribution of mechanic population within Albuquerque area automotive service industry compared to the distribution of NIASE tune-up certified mechanics

Idle emissions tests in many parts of the country have revealed that up to fifty percent of in-use vehicles are adjusted beyond the recommended parameter settings. For this reason, those facilities claiming to have "trained" personnel (180 facilities) were asked if the training received had placed an emphasis on "low emissions." As shown in Table 2-6, 124 facilities responded yes, low emissions had been emphasized.

TABLE 2-6 FACILITIES WITH AT LEAST ONE EMPLOYEE TRAINED IN LOW EMISSIONS REPAIRS

	Type of Facility	Number of Facilities	% of category
I	New Car Dealerships	21 of 21	100.0
II	Full Service Gasoline Retailers	58 of 113	51.3
III	Independent Service Garages	41 of 58	70.7
IV	Tune-Up Specialists	4 of 9	44.4
	TOTALS	124 of 180	68.9

Thus, the survey disclosed a 20% reduction in the number of facilities employing mechanics who have been formally exposed to the knowledge and procedures required to competently perform low emissions maintenance compared to the total number whose employees have received tune-up training.

The most comprehensive training effort appears to have been made at the new car dealerships. (100% of these facilities have at least one employee whose training emphasized low emissions).

The independent service garages indicated that 70.7% likewise had thoroughly trained personnel.

The conclusion may be drawn from this data, when assessed along with other information concerning mechanics developed by the survey, that the likelihood of finding the better trained mechanics is higherat an independent garage than at a full service gasoline retailer or tune-up specialist, and highest (100% certainty) at a new car dealership. This is probably due to the increased sense of professionalism as evidenced by the scale of wages and benefits which is generally found in dealership service departments and the established independent garages.

This relationship among the various categories of automotive service facilities is depicted graphically in Figure 2-2.

.4 PERCEIVED NEED FOR ADDITIONAL LOW EMISSIONS TUNE-UP TRAINING

The National Center is presently committed to the development and initiation of a mechanic training curriculum in Albuquerque. As was discussed previously, this training effort is part of a technical assistant project designed to help insure the successful implementation of the I/M program in the Albuquerque area.

Therefore, the outcome of the needs assessment would probably not proscribe any mechanic training commitment for Albuquerque. If, however, a majority of survey respondents held negative attitudes concerning the need for additional I/M-oriented training, the task of recruitment for training sessions would be a difficult one.

This scenario of pervasive negative attitudes was not found to be the case. After answering the previous training related questions, the respondents were asked, "Are you willing to have your employees participate in low emissions tune-up training sponsored by the City of Albuquerque?", a total of 92.5% answered yes. The results of this question are broken down in Table 2-7.

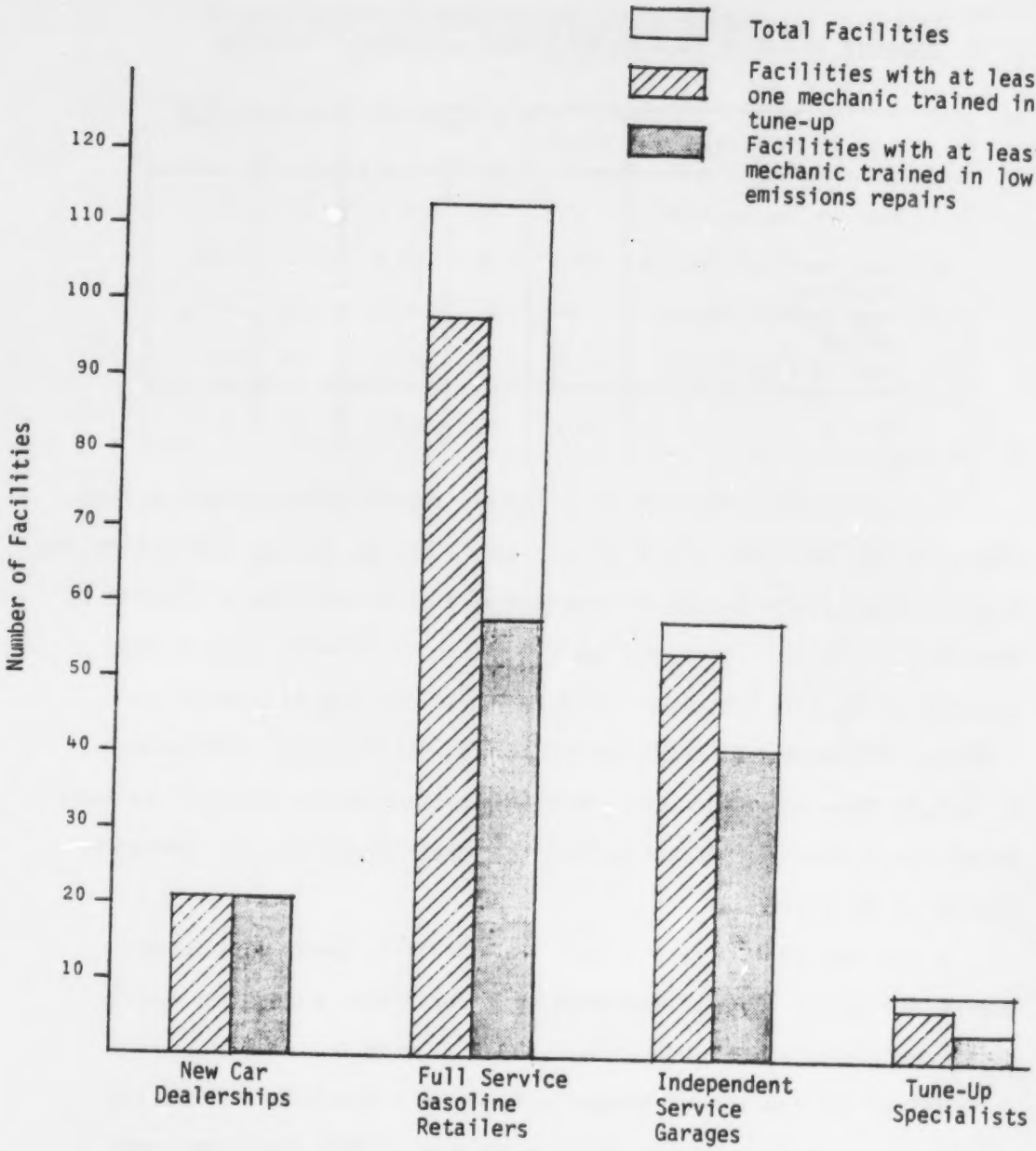

FIGURE 2-2

Distribution of automotive service facilities with employees trained in tune-up procedures and low emissions repairs

TABLE 2-7 WILLINGNESS OF VARIOUS AUTOMOTIVE SERVICE INDUSTRY SEGMENTS TO PARTICIPATE IN ADDITIONAL I/M-RELATED TRAINING

	Type of Facility	Total	Yes Responses #	Yes Responses %	No Responses #	No Responses %
I	New Car Dealerships	21	19	90.5	2	9.5
II	Full Service Gasoline Retailers	113	100	88.5	13	11.5
III	Independent Service Garages	58	58	100.0	0	----
IV	Tune-Up Specialists	9	9	100.0	0	----
	TOTALS	201	186	92.5	15	7.5

It is of interest that the only industry segment which claimed to have highly trained employees at all of its facilities, the new car dealerships, was also the only segment to show a reduction when asked about their interest in additional training. There were two (2) dealership service managers who expressed a negative attitude. These feelings were said to be based on a lack of willingness to encourage "off-the-street" business from owners of vehicle makes other than those sold (and preferentially serviced) at their respective dealerships and the feeling that their employees were adequately trained by the factory.

In the case of full service gasoline retailers, the only other non-unanimous industry segment, spokesmen at 13 facilities stated they had no desire for I/M-related repairs, tune-up work or both.

100% of the independent garages and tune-up specialists expressed a willingness to have additional training designed to help their employees more effectively accomplish I/M-related repairs.

2.5 PREFERRED CLASS TIMES

The 186 respondents who expressed an interest in additional training were asked a series of questions concerning the preferential scheduling of the 16-hour training course.

As shown by Table 2-8, a clear majority stated a preference for weekday evenings (88.8%).

TABLE 2-8 PREFERRED CLASS TIME FOR RESPONDENTS WITH POSITIVE ATTITUDE CONCERNING ADDITIONAL TRAINING

Preferred Class Time	#	% of Total
During Working Hours (daytime)	11	5.4
After Work (weekday evenings)	182	88.8
Saturdays	12	5.8
TOTALS	205*	100.0

*Some of the 186 respondents expressed more than one preference.

2.6 PREFERRED CLASS LENGTH

The same 186 respondents were next asked the number of hours they would prefer each class session. 66.1% stated a preference for a 2-hour class; and 23.3% preferred a 3-hour class. The combination of these two sets of responses indicates that 89.3% of all respondents have a preference for a class length of between 2 and 3 hours. (see Table 2-9)

TABLE 2-9 PREFERRED CLASS LENGTH FOR RESPONDENTS WITH POSITIVE ATTITUDE CONCERNING ADDITIONAL TRAINING

Preferred Class Length	#	% of Total
1 Hour	10	5.3
2 Hours	125	66.1
3 Hours	44	23.3
4 Hours	10	5.3
TOTALS	189*	100.0

*Some of the 186 respondents expressed more than one preference.

2.7 PREFERRED NUMBER OF CLASSES PER WEEK

It was explained to each survey participant that the curriculum which was under consideration for use in the Albuquerque area involved approximately sixteen hours of class attendance. Bearing this in mind, along with their responses to the two preceding questions, the respondents were asked their preference as to the number of class meetings per week. The results are presented in Table 2-10.

TABLE 2-10 PREFERRED NUMBER OF CLASS MEETINGS PER WEEK FOR RESPONDENTS WITH POSITIVE ATTITUDES CONCERNING ADDITIONAL TRAINING

Preferred Number of Classes Per Week	#	% of Total
One	15	8.2
Two	92	50.3
Three	58	31.7
Four	9	4.9
Five	9	4.9
TOTALS	183*	100.0

*Three respondents expressed no preference.

Here, too, the majority preference is evident. 50.3% expressed a preference for two meetings per week; and, 31.7% preferred three meetings per week. The combination of these two sets of responses indicates that 82.0% of all respondents have a preference for between 2 and 3 class meetings per week.

2.8 WILLINGNESS TO PARTICIPATE IN A VOLUNTARY CERTIFICATION PROGRAM

One of the areas of controversy which has arisen in the Albuquerque debate concerning the implementation of I/M has been the issue of governmental licensing of mechanics and/or repair facilities. The factors underlying the vocal opposition to such a licensing scheme seem to be the resentment of an additional level of bureaucracy burdening the small businessman and the possible restriction of repairs performed on vehicles which fail the emission inspection to those facilities "approved" by the City or County.

While the licensing of repair facilities for consumer protection purposes and the restriction of I/M-related repairs to designated facilities have both been instituted in states other than New Mexico, the leadership of the various automotive service industry trade associations have been adamantly opposed to these measures being linked to the Albuquerque I/M program.

In order to determine if this attitude expressed by industry spokesmen was shared by the managers of individual facilities, and to determine the willingness of facilities to cooperate to attain a new level of consumer assurance of quality, the following question was asked of all respondents:

"Would you be willing to have your facility participate in a voluntary low emissions tune-up certification program?"

It was explained to each respondent, prior to his/her response, that this would consist of a published "Consumer Guide" listing all consenting facilities having the following:

1. properly calibrated and operating infrared equipment, and
2. at least one mechanic trained in low emissions tune-up procedures.

The breakdown of responses by type of facility is shown in Table 2-11.

TABLE 2-11 WILLINGNESS OF VARIOUS AUTOMOTIVE SERVICE INDUSTRY SEGMENTS TO PARTICIPATE IN VOLUNTARY CERTIFICATION PROGRAM

Type of Facility	Total	Yes Responses #	Yes Responses % of category	No Responses #	No Responses % category
I New Car Dealerships	21	13	61.9	8	38.1
II Full Service Gasoline Retailers	113	92	81.4	21	18.6
III Independent Service Garages	58	48	82.8	10	17.2
IV Tune-Up Specialists	9	8	88.9	1	11.1
TOTALS	201	161	80.1	40	19.9

The overall percentage of positive responses was 80.1%. The lowest response category was the new car dealers, with only 13 out of 21 facilities giving a positive response (61.9%). The reasons given were essentially those discussed previously, i.e. they are committed and specially trained to perform service on a limited number of vehicle makes and do not wish to be "advertised" as being available to perform service on a variety of vehicles made by other manufacturers.

Each of the other three categories of service facilities gave positive responses greater than 80%. (See Table 2-11)

2.9 WILLINGNESS TO HAVE PERIODIC INSPECTIONS BY LOCAL GOVERNMENT

As a corollary to the question concerning voluntary certification, each survey participant was asked the following question:

"Would you be willing to have your equipment and tune-up procedures inspected from time to time by the City Environmental Health Department?"

As shown by Table 2-12, an overall percentage of 75.1% answered "yes." There were slight reductions in the number of positive responses given to this question when compared to the previous question (on page 20). These reductions occurred in all categories of facilities with the exception of new car dealerships.

It may be inferred from a joint analysis of these two survey items that three-quarters of the automotive service facilities in the Albuquerque area would be willing to participate in a voluntary low emissions tune-up certification program, even if this would entail periodic inspections for quality control purposes by local government personnel.

TABLE 2-12 NUMBER OF FACILITIES WILLING TO HAVE EQUIPMENT AND PROCEDURES PERIODICALLY INSPECTED BY LOCAL GOVERNMENT PERSONNEL

Type of Facility	Total	Yes Responses #	Yes Responses % of category	No Responses #	No Responses % of category
I New Car Dealerships	21	13	61.9	8	38.1
II Full Service Gasoline Retailers	113	87	77.0	26	23.0
III Independent Service Garages	58	45	77.6	13	22.4
IV Tune-Up Specialists	9	6	66.7	3	33.3
TOTALS	201	151	75.1	50	24.9

2.10 EQUIPMENT CAPABILITIES OF ALBUQUERQUE AREA SERVICE FACILITIES

As a further indication of the current level of expertise, training and ability to respond to the anticipated demand for I/M-generated repair business, each facility was asked if there was an infrared exhaust gas analyzer on the premises. These findings are presented in Table 2-13.

TABLE 2-13 DISTRIBUTION OF INFRARED EXHAUST GAS ANALYZERS AMONG ALBUQUERQUE AREA AUTOMOTIVE SERVICE INDUSTRY

Type of Facility	Number with IR Equipment	% of category
I New Car Dealerships	21 of 21	100.0
II Full Service Gasoline Retailers	25 of 113	22.1
III Independent Service Garages	12 of 58	20.7
IV Tune-Up Specialists	6 of 9	66.7
TOTALS	64 of 201	31.8

The only industry segment found to have infrared equipment in 100% of their facilities were the new car dealerships. Less than one-fourth of the full service gasoline retailers and independent garages were so equipped.

SECTION 3

ACCOMPLISHMENT OF ADDITIONAL OBJECTIVES

3.1 EFFORTS TO INFLUENCE FORMATION OF POSITIVE ATTITUDES AMONG AUTOMOTIVE SERVICE INDUSTRY PERSONNEL

The accomplishment of the final objectives of this needs assessment is not readily quantifiable due to the fact that the tasks are concerned with psychological processes such as attitudes, perceptions and cognitive understanding. These aspects of the individual service manager or mechanic's point of view with regard to I/M are nonetheless critical to the success of the program. For this reason, each member of the interview team was fully briefed on the status of Albuquerque's I/M program, the programmatic choices which had been made, and the role of the automotive service industry in the I/M effort. In addition, the rationale and implications of the proposed voluntary certification program were explained to the interview team.

With this background information, the survey team members were able to provide answers to many questions posed at the conclusion of each interview. Thus, the objectives of explaining the Albuquerque program to the personnel of each facility, and, attempting to influence attitude formation were accomplished through the dissemination of accurate information, informed responsiveness to stated concerns of service facility operators and the emphasis on the potential for expansion of service markets due to I/M-related business.

3.2 DEVELOPMENT OF FOUNDATION FOR FUTURE RELATIONS WITH AUTOMOTIVE SERVICE INDUSTRY

The respondents to the needs assessment survey were told at the conclusion of the interview that, as survey participants, they would be informed about the training course schedule. They were cordially thanked for their time and the

input which they provided. Many respondents expressed surprise and/or gratitude that someone from "Government" had taken the time to assess their needs and explain this new program to them.

Through the mechanism of soliciting input from the service industry, the individuals contacted were, for the most part, effectively co-opted into the planning process. Interest has been generated among service personnel which did not previously exist. The needs assessment field operations provided a physical demonstration of the importance of the automotive service industry to the attainment of Albuquerque's air quality goals, and left the respondents with the knowledge that news of further developments affecting them would be forthcoming.

3.3 ASSESSMENT OF VALIDITY OF THE STATED POSITIONS OF AUTOMOTIVE SERVICE INDUSTRY SPOKESMEN WITH REGARD TO: NEED FOR FURTHER TRAINING, CERTIFICATION PROGRAMS AND I/M IN GENERAL

The I/M project manager of the Albuquerque Environmental Health Department informed the National Center staff that the leadership of the automotive service industry had stated repeatedly that the local industry was adequately trained and opposed to any form of certification or licensing of facilities.

The data collected from the rank and file operators of 201 service facilities definitely contradicted the stated views of the industry leadership. The highly skewed positive responses given to the survey questions concerning the perceived need for additional training in low emissions tune-up and the willingness to participate in a voluntary certification and inspection program provide the factual basis for this contradiction.

SECTION 4

RECOMMENDATIONS

4.1 TRAINING NEEDS

Based upon the findings of the needs assessment, it is recommended that a training course in emissions diagnosis and repair be instituted in the Abluquerque area. Of the automotive service facilities surveyed, 186 out of 201 (92.5%) expressed a willingness to have employees participate in this specialized training.

The course to be offered should be the recently developed Federal Course on Emissions Systems Diagnosis. It would be taught by technical instructors from the Albuquerque area who have undergone intensive preparatory training by the staff of the National Center for Vehicle Emissions Control and Safety at Colorado State University. These instructors will, in turn, provide a basis for the training effort directed at practicing mechanics and other interested persons.

4.2 COURSE SCHEDULING

Based upon the responses given in the needs assessment survey, it is recommended that the emissions diagnosis course be offered on weekday evenings; that the length of each class session be not more than three (3) hours; and, that there be not more than three (3) class sessions held per week.

4.3 VOLUNTARY CERTIFICATION

Of the automotive service facilities surveyed, 80.1% responded positively to the concept of a voluntary low emissions tune-up certification program. When it was explained to the respondents that certification would entail periodic inspections of their equipment and service procedures, the level of

positive response among the industry as a whole was 75.1%.

Based upon the above findings, it is recommended that the City of Albuquerque initiate a program wherein those facilities which meet the stipulated criteria, and which give their written consent, be listed in a "Consumers Guide to Low Emissions Repair Facilities." Such a guide should be provided to motorists at the time of an I/M test failure. It should include appropriate disclaimers so that the industry and the consumers perceive that I/M-related maintenance work is not limited to the facilities listed, but that, in the technical opinion of local officials, the businesses listed in the Guide are known to be properly equipped and trained to diagnose I/M failures and perform the required repairs.

The published Guide should be updated not less than every ninety (90) days. Implicit in this update is the requirement that each facility listed, as well as those desirous of being listed, be inspected within the subsequent 90-day period.

It is perceived that the I/M program in the Albuquerque area will benefit from the implementation of this consumer protection measure. The motoring public should respond positively to this effort by government to assist them in obtaining qualified servicing. In addition, this step is a means of providing a continuous incentive to the automotive service industry to update their equipment and technical capabilities and to maintain a cooperative attitude toward Albuquerque's I/M program goals.

4.4 PROGRAM PLANNING

Inherent in the findings of this needs assessment is the incorporation of the recommendations into the planning efforts of the Inspection and Maintenance Section of the Air Pollution Control Division of the Albuquerque Department of Environmental Health.

There should be a recognition within the Department of the importance of developing and maintaining a positive relationship with the automotive service industry as a whole and with individual repair facilities.

In order to accomplish this objective, there should be a person within the I/M section primarily dedicated to the coordination of all mechanic-related activities.

4.5 FUTURE AWARENESS EFFORTS

It is the perception of the National Center that a major stride has been made in the area of increasing the awareness and interest of the Albuquerque automotive service industry in the forthcoming I/M program.

Due to the importance of the industry, both in the attainment of air quality goals and in the formulation of public opinion concerning I/M, further efforts to inform the industry of technical and programmatic developments should be undertaken.

4.6 EQUIPMENT NEEDS

Based upon the findings of the needs assessment, it can be concluded that less than one-third of the automotive service facilities in the Albuquerque area are presently equipped with infrared exhaust gas analyzers. Since this test equipment is essential to insure passage of a re-test, and is likely to be a prerequisite for being listed in any published consumer guide, the local service industry should be encouraged to make the necessary equipment acquisition at the earliest practical date.

Many of the respondents expressed reservations about acquiring infrared equipment for the following two reasons:

1) relatively high purchase price, and
2) uncertainty as to which models will be "acceptable" to and compatible with the I/M program.

While local officials should not be placed in a posture of promoting the sales of infrared equipment, or advocating particular vendors over others, it is desirable to encourage the expansion of the equipment capability of the service industry. This may be done, in part, by the timely development of equipment specifications, and the dissemination of these specifications to the industry and to equipment vendors.

4.7 DISSEMINATION OF FINDINGS

This needs assessment of the automotive service industry was unique in several respects. The City of Albuquerque is approaching the implementation of I/M in a comprehensive manner. The overall goal of the program is to develop tools, data, manpower and public awareness designed to insure the success of I/M in Albuquerque with respect to air quality, effective maintenance and public opinion.

This comprehensive effort is not only laudable, but also may be required for any program start-up. With this in mind, the National Center suggests dissemination of these findings and this report to regional offices of the United States Environmental Protection Agency, and to State and Local officials as appropriate.

APPENDIX A

NEEDS ASSESSMENT SURVEY QUESTIONNAIRE

Albuquerque and Bernalillo County are developing a program of mandatory motor vehicle exhaust inspection and maintenance. Vehicles which fail to meet the emission standards will need some engine or emission control maintenance performed in order to pass a re-inspection. This means that the local vehicle service industry will play a key role in the success of this major effort.

A program of low-emission tune-up training is being developed for Bernalillo County. In order to help design this training course to provide the maximum benefit for you and your employees, we ask that you take a few minutes to answer the following questions: (PLEASE PRINT)

Name of person being interviewed: _____

Position:

___Owner
___Manager
___Employee
___Other _____

Name of Facility: _____

Business Address: _____

_____

Mailing Address (if different): _____

_____

Business Phone: _____

A. Type of Business (choose one):

New Car Dealer	1. ___
Full Service Station	2. ___
Independent Garage	3. ___
Tune-up Specialist	4. ___
Other	5. ___

B. Average number of tune-ups performed weekly:

0-10	6. ___
10-20	7. ___
Over 20	8. ___

C. Number of mechanics currently employed:

Actual number _____

0-2	9. ___
3-5	10. ___
over 5	11. ___

D. Number of infrared exhaust analyzers owned or leased:

12. ___

E. Makes and model numbers: _____

_____

_____

F. Age of IR equipment:

13. ___

G. How often are exhaust analyzers used:

Daily	14. ___
Weekly	15. ___
Monthly	16. ___
Never	17. ___

H. Have your employees had any formal training in tune-up procedures:

Yes	18. ___
No	19. ___

I. If yes (question H), which course(s) have they taken: (Check all that apply)

in-house	20. ___
auto manufacturer	21. ___
equipment vendor	22. ___
oil company	23. ___
vo-tech school	24. ___
other_____	25. ___

J. If yes, (question H), were low-emissions emphasized:

Yes	26. ___
No	27. ___

K. Are you willing to have your employees participate in low-emissions tune-up training sponsored by City of Albuquerque.

Yes	28. ___
No	29. ___

L. Would you prefer that the course be given:

during working hours (daytime)	30. ___
after work (evenings)	31. ___
weekends	32. ___

M. Preferred length of each training session:

1 hour	33. ___
2 hours	34. ___
3 hours	35. ___
4 hours	36. ___

N. Preferred number of meetings per week:

one	37. ___
two	38. ___
three	39. ___
four	40. ___
five	41. ___

O. Have any of your employees received NIASE Tune-up Certification:

Yes	42. ___
No	43. ___

P. If so, how many: 44. ___

Q. Would you be willing to have your facility participate in a <u>Voluntary</u> "Low-emissions tune-up" certification program:

Yes	45. ___
No	46. ___

R. Would you be willing to have your equipment and tune-up procedures inspected from time to time by the City Environmental Health Department:

Yes	47. ___
No	48. ___

S. Comments made by respondent:

_____

_____

_____

_____

T. Observations of interviewer:

_____

_____

_____

_____

Thank you for taking the time to answer these questions. The information you have just provided will be very useful in planning the training course. The first series of classes will be free of charge; and you will be notified in time for you and your employees to sign-up. We hope you will participate in the training course -- we know it will help improve skills needed to meet the coming demand for qualified low-emission tune-up specialists.

Interviewer's Name: _____

PLEASE PRINT

APPENDIX B - SURVEY RESPONSES

1. What is the average number of tune-ups performed weekly at your facility?

Type of Facility	Average Weekly Tune-Ups		
	0-10	10-20	Over 20
I New Car Dealerships	0	2	19
II Full Service Gasoline Retailers	90	19	4
III Independent Service Garages	24	19	13
IV Tune-Up Specialists	5	2	2
TOTALS	119	42	38

2. How many mechanics do you presently employ at your facility?

Type of Facility	Mechanics Presently Employed			Actual Total of Mechanics
	0-2	3-5	Over 5	
I New Car Dealerships	0	1	20	363
II Full Service Gasoline Retailers	76	33	4	258
III Independent Service Garages	29	23	6	201
IV Tune-Up Specialists	3	6	0	23
TOTALS	108	63	30	845

3. Do you currently have a working infrared exhaust gas analyzer? If so, how many?

Type of Facility	Yes	No	Number of Analyzers in Category
I New Car Dealerships	21	0	44
II Full Service Gasoline Retailers	25	88	29
III Independent Service Garages	12	46	19
IV Tune-Up Specialists	6	3	8
TOTALS	64	137	100

4. How ofen do you use your infrared analyzer?

Type of Facility	Frequency of Usage			
	Daily	Weekly	Monthly	Never
I New Car Dealerships	21	0	0	0
II Full Service Gasoline Retailers	19	5	0	1
III Independent Service Garages	10	0	1	1
IV Tune-Up Specialists	5	1	0	0
TOTALS	55	6	1	2

5. How long have you had an infrared exhaust analyzer?

Type of Facility	Average Age of Analyzers (in years)
I New Car Dealerships	2.5
II Full Service Gasoline Retailers	1.7
III Independent Service Garages	2.3
IV Tune-Up Specialists	1.1

6. Have you or any of your employees had any formal training in tune-up procedures?

Type of Facility	Yes	No
I New Car Dealerships	21	0
II Full Service Gasoline Retailers	98	15
III Independent Service Garages	54	4
IV Tune-Up Specialists	7	2
TOTALS	180	21

7. Where did this training take place?

Type of Facility	In-House	Auto Mfg.	Equip. Vendor	Oil Co.	Vo-Tech School	Military
I New Car Dealerships	7	21	10	0	9	0
II Full Service Gasoline Retailers	34	13	33	30	40	15
III Independent Service Garages	14	19	19	2	25	11
IV Tune-Up Specialists	3	3	4	0	4	1
TOTALS	58	56	66	32	78	27

8. Did the tune-up training emphasize "low-emissions?"

Type of Facility	Yes	No
I New Car Dealerships	21	0
II Full Service Gasoline Retailers	58	40
III Independent Service Garages	41	13
IV Tune-Up Specialists	4	3
TOTALS	124	56

9. Are you willing to have your employees participate in additional low emissions tune-up training sponsored by the City of Albuquerque?

Type of Facility	Yes	No
I New Car Dealerships	19	2
II Full Service Gasoline Retailers	100	13
III Independent Service Garages	58	1
IV Tune-Up Specialists	9	0
TOTALS	186	15

10. What time of day do you prefer the training course be offered?

Type of Facility	Preferred Time of Day		
	During Work	Evenings	Saturdays
I New Car Dealerships	2	18	3
II Full Service Gasoline Retailers	7	100	5
III Independent Service Garages	2	55	4
IV Tune-Up Specialists	0	9	0
TOTALS	11	182	12

11. How long do you think each class session should be?

Type of Facility	Preferred Class Length			
	1 hr.	2 hrs.	3 hrs.	4 hrs.
I New Car Dealerships	2	10	7	1
II Full Service Gasoline Retailers	2	72	22	8
III Independent Service Garages	4	38	13	1
IV Tune-Up Specialists	2	5	2	0
TOTALS	10	125	44	10

12. How many class sessions would you prefer each week?

Type of Facility	Preferred Class Sessions per Week				
	1	2	3	4	5
I New Car Dealerships	3	12	4	0	0
II Full Service Gasoline Retailers	6	42	37	7	9
III Independent Service Garages	6	33	14	1	0
IV Tune-Up Specialists	0	5	3	1	0
TOTALS	15	92	58	9	9

13. Does your facility employ any mechanics who are currently NIASE-certified in tune-up? If so, how many?

Type of Facility	Yes	No	Actual Number NIASE-Certified
I New Car Dealerships	19	2	94
II Full Service Gasoline Retailers	21	92	30
III Independent Service Garages	18	40	29
IV Tune-Up Specialists	3	6	5
TOTALS	61	140	158

14. Would you be willing to have your facility participate in a voluntary low emissions tune-up certification program?

Type of Facility	Yes	No
I New Car Dealerships	13	8
II Full Service Gasoline Retailers	92	21
III Independent Service Garages	48	10
IV Tune-Up Specialists	8	1
TOTALS	161	41

15. Would you be willing to have your equipment and tune-up procedures inspected from time to time by the City Environmental Health Department?

Type of Facility	Yes	No
I New Car Dealerships	13	8
II Full Service Gasoline Retailers	87	26
III Independent Service Garages	45	13
IV Tune-Up Specialists	6	3
TOTALS	151	50

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
David Rusk

September 17, 1979

To: Auto Service Industry

Albuquerque and Bernalillo County are developing a program of mandatory motor vehicle exhaust inspection and maintenance. Vehicles which do not pass the initial exhaust test will need some engine or emission control maintenance performed in order to pass a re-inspection.

This means that the local vehicle service industry will play a key role in the success of this major effort. A program of low emission tune-up training is being developed by the National Center for Motor Vehicle Emissions Control and Safety located at Colorado State University.

In order to help design this training course to provide the maximum benefit for you and your employees, I ask your cooperation in taking a few minutes of time to answer several questions.

I am very pleased that the citizens of Albuquerque and Bernalillo County have been afforded this opportunity, and I solicit your cooperation.

Sincerely,

David Rusk
Mayor

DR/rec

AN EQUAL OPPORTUNITY EMPLOYER

APPENDIX D

NEEDS ASSESSMENT PROJECT PARTICIPANTS

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and Safety - Colorado State University

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Leo Carroll

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City of Albuquerque

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